conditions, the third column the test temperature and the last column gives the hardness. In each case the first stage of heat treatment is hardening for 1000°C at 2 hours and the different kinds of tempering are: (1) at 420°C for two hours; (2) at 720°C for two hours and (3) at 760°C for two hours. The tests were made on a fatigue machine type HY (NU) with a device for the application of static tension. The equipment was calibrated with two resistance strain gauges and graphs were plotted of the relationship between the bending stress in the specimen and the applied load for several values of static stress. The frequency of load application was 50 c/s. The specimen was heated by a resistance furnace. The instrumentation is briefly described. For the various heat treatments described above, Table 2 gives the test temperature and the tensile stresses (mean stresses over the cycle in kg/mm^2). The test results are plotted in Fig.2 and 3: Fig.2 corresponding to heat treatment conditions (1), curves (a) at 100°C and (b) at 400°C; Fig.3 to tests at 100°C on (a) heat treatment conditions (2) and (b) heat treatment conditions (3). Table 3 gives the fatigue limits found for the various materials.

The results are best presented in the form of graphs in coordinates of the mean stress in the cycle and the amplitude value of the fatigue limit. A diagram of this kind is plotted in Fig.4 for test results at 100°C. The numbers on the curves correspond to the different heat treatments. The test results show that the mean stress of a cycle within the range of investigation has no influence on the fatigue limit in bending of steel 1Kh13 when the tempering temperature is low and the yield point and ultimate strength are high. On the other hand, for the same steel deeply tempered to be of lower strength and greater plasticity, the fatigue limit is greatly reduced by increasing the maximum stress. In the absence of static loading the ratio of the fatigue limit to the ultimate strength for steel 1Kh13 is constant and does not depend on the heat treatment or test temperature, being 0.40 to 0.42. No appreciable difference was found between the fatigue limits of steel 1Kh13 at temperatures of 100 and 400°C. The work of M.F.Sichikov, Z.D.Vishnevetskiy and D.L.Ginberg (Ref.1) is discussed and the following main conclusions are drawn. The application of appreciable constant

tensile stresses (up to 35 kg/mm^2) during variable bending does not reduce the fatigue limit of specimens of the first batch of steel 1Kh13 of high strength characteristics. For example, for this batch the maximum stress corresponding to the fatigue limit is 80 kg/mm^2 which is 96% of the yield point at 100°C. No reduction in the fatigue limit was found for this batch of specimens at a temperature of 400°C. On the other hand, tests on samples of the same steel which had been tempered at a higher temperature to ensure greater plasticity though lower strength (second and third batches) revealed considerable reduction of fatigue limit (by 24%) during investigations with static stress. These results, combined with other published work, show that there is no single relationship between the strength of steels and their sensitivity to the mean stress of the cycle. The fatigue limit of steels of high ultimate strength often does not depend on the mean stress of the cycle and vice versa. The results may be understood if one takes into account the appreciable irreversible energy dispersion in the material which occurs in steel 1Kh13 tempered at a high temperature. M.A.Voropayev (Ref.9),

S/122 /61/000/007/003/007
D209/D304

AUTHOR: Troshchenko, V.T., Candidate of Technical Sciences

TITLE: Investigating the design strength of steam turbine blades

PERIODICAL: Vestnik mashinostroyeniya, 41 no. 7, 1961, 35 - 37

TEXT: The author examines the 1st and 9th stage blades of a steam turbine and explains why the fatigue limit of a working blade is lower than that of the material of which it is made. Two factors are stated to contribute to this discrepancy: technological and constructional. To obtain reliable information on the strength of heavy duty turbine blades an investigation must be made which closely resembles the actual working conditions of turbine blades. The blades of the 1st and 9th stage of a steam turbine type CKP-100 (SKR-100) with an output of 100.000 Kw are shown. They are made of austenite steel of grade ЭИ-612 (EI-612). Two similar types of blades were investigated, the only difference between them

Card 1/3

being a cooling duct cut into the tail end of one of the blades for cooling the rotor by means of low temperature steam. Blades made of the same material as the blades of turbine, EI612, were subjected to a pulling force, equivalent to the centrifugal force acting on the actual baldes in the turbine along the weakest section. The experiment was carried out on a Y-363 (U-363) type of fatigue testing machine. Testing the blades of the 1st stage is shown in Fig. 2. In this machine the blades are subjected to cycles of alternating stresses. Stresses due to tension are determined by a static dinamometer and the alternating stresses are obtained by strain gauges attached to the blades. The temperature of the blades was checked by means of a thermocouple welded onto it. The results of this experiment are shown in Fig. 3, based on 30 M/cs. In Fig. 3 points designated by Δ represent blades with a cooling duct and o represents blades without cooling ducts. From the results obtained the author states that the cooling ducts have no influence on the strength of the blades. Fracture always took place in the vicinity of the weakest section, i.e. where the stress

concentration was the highest. The author concludes that the working stress of turbine blades is much lower than the strength of the same blades obtained by laboratory experiments. The reduction in strength is due to technological and constructional factors. The cooling ducts cut into the tail end of the blades have no effect on the working strength of the turbine blades. There are 4 figures, 2 tables and 2 Soviet-bloc references.

TROSHCHENKO, V.T. AND PISARENKO, G.S.

"Mechanics properties of materials manufactured by powder metallurgical methods.

Paper presented at the Powder Metallurgy Conference
Smolenice, Czech/ 17-20 Sep 1962

PISARENKO, Georgiy Stepanovich; TROSHCHENKO, Valeriy Trofimovich; TIMOSHENKO, Vsevolod Georgiyevich; KUZ'MENKO, Vasiliy Aleksandrovich; ISAKHANOV, Georgiy Vakhtangovich; TRET'YACHENKO, Georgiy Nikolayevich; GRYAZNOV, Boris Alekseyevich; NOVIKOV, Nikolay Vasil'yevich; RUDENKO, Vasiliy Nikitich; SHUMILOVA, Rufina Gerasimovna; LEBEDEV, I.V., red.; DAKHNO, Yu.B., tekhn. red.

[Strength of ceramic metals and alloys at normal and high temperatures]Prochnost' metallokeramicheskikh materialov i splavov pri normal'nykh i vysokikh temperaturakh. Kiev, Izd-vo Akad. nauk USSR, 1962. 274 p. (MIRA 16:2)

1. Chlen-korrespondent Akademii nauk Ukr.SSR (for Pisarenko).
(Ceramic metals)
(Metals at high temperatures)

TROSHCHENKO, V.T.

PHASE I BOOK EXPLOITATION SOV/6342

Pisarenko, Georgiy Stepanovich, Valeriy Trofimovich Troshchenko, Vsevolod Georgiyevich Timoshenko, Vasiliy Aleksandrovich Kuz'menko, Georgiy Vakhtangovich Isakhanov, Georgiy Nikolayevich Tret'yachenko, Boris Alekseyevich Gryaznov, Nikolay Vasil'yevich Novikov, Vasiliy Nikitich Rudenko, and Rufina Gerasimovna Shumilova

Prochnost' metallokeramicheskikh materialov i splavov pri normal'nykh i vysokikh temperaturakh (Strength of Sintered Materials and Alloys at Room and High Temperatures) Kiyev, Izd-vo Akademii nauk UkrSSR, 1962. 274 p. Errata slip inserted. 2400 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Resp. Ed.: G. S. Pisarenko, Corresponding Member, Academy of Sciences USSR; Ed.: I. V. Lebedev; Tech. Ed.: Yu. B. Dakhno.

Card ~~1/9~~ 1/2

Strength of Sintered Materials (Cont.) SOV/6342

PURPOSE: The book is intended for engineers, scientific research workers, aspirants, and students concerned with problems of the strength of sintered materials and structural parts.

COVERAGE: The book reviews the results of studying the strength, ductility, and elasticity of materials and structural parts produced by powder-metallurgy methods and presents brief information on these methods. Particular attention is given to methods of experimental investigation of physical and mechanical characteristics of heat-resistant sintered materials with specific properties, and to the description of a number of testing units developed for these investigations. Some problems of the theory of the strength of brittle sintered materials and high-porosity ductile materials are discussed. Laws governing changes in characteristics of strength and elasticity under the effect of various factors are outlined. The appendix includes reference tables with data on the basic mechanical characteristics of a number of sintered materials. The assistance of members of the Powder Metallurgy Institute V. I. Kovpak, Yu. A. Kashtalyan, L. V. Kravchuk. A. P. Yakovlev, V. K. Kharchenko, V. K. Kuz'menko, and V. A. Chebotarev is acknowledged. There are 141 references, mostly Soviet.

Card ~~2/9~~ 3/2

PHASE I BOOK EXPLOITATION SOV/6342

Pisarenko, Georgiy Stepanovich, Valeriy Trofimovich Troshchenko, Veevolod Georgiyevich Timoshenko, Vasiliy Aleksandrovich Kuz'menko, Georgiy Vakhtangovich Isakhanov, Georgiy Nikolayevich Tret'yachenko, Boris Alekseyevich Gryaznov, Nikolay Vasil'yevich Novikov, Vasiliy Nikitich Rudenko, and Rufina Gerasimovna Shumilova

Prochnost' metallokeramicheskikh materialov i splavov pri normal'nykh i vysokikh temperaturakh (Strength of Sintered Materials and Alloys at Room and High Temperatures) Kiyev, Izd-vo Akademii nauk UkrSSR, 1962. 274 p. Errata slip inserted. 2400 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Resp. Ed.: G. S. Pisarenko, Corresponding Member, Academy of Sciences USSR; Ed.: I. V. Lebedev; Tech. Ed.: Yu. B. Dakhno.

Card 1/9

PURPOSE: The book is intended for engineers, scientific research workers, aspirants, and students concerned with problems of the strength of sintered materials and structural parts.

COVERAGE: The book reviews the results of studying the strength, ductility, and elasticity of materials and structural parts produced by powder-metallurgy methods and presents brief information on these methods. Particular attention is given to methods of experimental investigation of physical and mechanical characteristics of heat-resistant sintered materials with specific properties, and to the description of a number of testing units developed for these investigations. Some problems of the theory of the strength of brittle sintered materials and high-porosity ductile materials are discussed. Laws governing changes in characteristics of strength and elasticity under the effect of various factors are outlined. The appendix includes reference tables with data on the basic mechanical characteristics of a number of sintered materials. The assistance of members of the Powder Metallurgy Institute V. I. Kovpak, Yu. A. Kashtalyan, L. V. Kravchuk, A. P. Yakovlev, V. K. Kharchenko, V. K. Kuz'menko, and Y. A. Chebotarev is acknowledged. There are 141 references, mostly Soviet.

37965

S/137/62/000/005/055/150
A006/A101

15.2400

AUTHORS: Troshchenko, V. T., Gryaznov, B. A.

TITLE: Some problems of fatigue strength of cermet materials

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 33, abstract 5G219 ("Ustalostn. prochnost' mater. i elem. Mater. konf. v Varshave, 12-14 maya, 1960 g". Varshava, 1961, 15-19)

TEXT: The fatigue strength of Cr_3C_2 - (I) and SiC (II) - base cermet materials was investigated as a function of the test temperature, machining of the specimens, stress concentration, and the nature of the strained state. Materials I were prepared by pressing under 1.25 ton/cm^2 pressure of a mixture containing Cr_3C_2 (85%) and Ni (15%) powder of $<40\mu$ granularity, and by sintering in Tamman furnaces in H_2 at 1,300°C. II was prepared by soaking with silicon briquet blanks which were manufactured by pressing graphite processed with bakelite. A short description is given of two fatigue testing machines designed specially for testing cermet materials at room and high temperatures (heating of the specimens is performed by direct passage of current). Fatigue tests of II with bending at 1,200°C and stresses as high as 5 and 7 kg/mm^2 show that with

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reduced stress, dissipation increases, and also the average number of cycles until the breakdown. As a result of fatigue tests made with II at 20 and 1,200°C, it was found that at low test bases, highest strength is shown by specimens tested at high temperatures. With a greater number of cycles changes take place; σ_w is then about 0.56 σ_ℓ at 20°C, on the basis of 10^7 cycles and about 0.55 σ_ℓ at 1,200°C on the basis of 10^6 cycles. Considerable residual deformation of I at 950°C prevented their breakdown. For non-treated I, σ_w was 30 kg/mm^2, for ground specimens σ_w was reduced down to 16 kg/mm^2; anodic-mechanical treatment had no effect upon σ_w. Specimens with stress concentrators showed σ_w as high as 16.6 kg/mm^2. It was found that σ_w of I was considerably reduced during their additional axial elongation and increased during compression. The dissipation of energy was found to increase in materials with a greater number of loading cycles with stresses over σ_w; this indicates the irreversibility of processes which take place during cyclic loading of cermet materials. There are 9 references.

A. Epik

[Abstracter's note: Complete translation]

37835

S/123/62/000/008/007/016
A004/A101

15.3450

AUTHORS: Troshchenko, V. T., Gryaznov, B. A.

TITLE: Some problems concerning the fatigue strength of cermet materials

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 8, 1962, 23, abstract 8A166 ("Ustalostn. prochnost' mater. i elem. Mater. konfer. v Varshave 12-14 maya 1960". Warszawa, 1961, 15-19)

TEXT: The authors investigated the effects of the test temperature (950 - 1,200°C), mechanical working, stress concentration and the kind of the stressed state on the fatigue strength of cermet materials based on chromium carbide (85% Cr_3C_2) and silicon carbide (49.22% SiC) on especially designed and manufactured machines (one with mechanical excitation of forces, the other with an electromagnetic one). The investigation results revealed that cermet alloys are subjected to fatigue, their test basis is 10^6 cycles, σ_w depends on the test temperature, stress raisers reduce σ_w. The specimen fracture does not show two clearly expressed zones (of porcelain-type form and the zone of brittle failure).

[Abstracter's note: Complete translation]

Card 1/1

ACCESSION NR: AT4013976 S/3070/63/000/000/0046/0050

AUTHOR: Troshchenko, V. T.

TITLE: Equipment for studies of energy dispersal in a material during fatigue tests

SOURCE: Novyye mashiny*i pribory*dlya ispy*taniya metallov. Sbornik statey. Moscow, Metallurgizdat, 1963, 46-50

TOPIC TAGS: metal fatigue test, energy dispersal, dynamic hysteresis loop method, fatigue failure, fatigue tester, dynamic hysteresis loop recorder, steel fatigue, metal fatigue

ABSTRACT: The author describes procedures and equipment (see Figs. 1 and 3 in the Enclosure) developed at the Institute for Metalloceramics and Special Alloys which permit a study of energy dispersal in a material during fatigue tests by means of the dynamic hysteresis loop method. The layout and procedures are claimed to be more advantageous than existing methods because: 1) most parts failing under recurrent variable loads operate here under flexion; 2) the highest fatigue point occurs in the presence of a plane cantilever bending stress; this permits tests at much higher loads, hence improved accuracy; 3) the counter can be attached at the

Card 1/6 2

ACCESSION NR: AT4013976

point of failure (see Fig. 2 in the Enclosure), hence variations in the effect being studied can be examined directly in the area of fatigue flaw formation. Specimens of steels No. 45 and 1Kh18N9T were tested and results are illustrated graphically (see Fig. 4 in the Enclosure). Orig. art. has: 1 graph, 4 illustrations.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute for Metalloceramics and Special Alloys)

SUBMITTED: 00 DATE ACQ: 20Feb64 ENCL: 04

SUB CODE: ML, SD NO REF SOV: 006 OTHER: 004

Card 2/6

ACCESSION NR: AT4040398 S/0000/63/000/000/0149/0158

AUTHOR: Troshchenko, V. T.

TITLE: The interrelationship between fatigue strength and energy dissipation in a material

SOURCE: Nauchno-tekhnicheskoye soveshchaniye po voprosam kolebaniy s uchetom rasseyaniya energii. 4th, 1962. Rasseyaniye energii pri kolebaniyakh uprugikh sistem (Energy dissipation during vibrations of elastic systems); trudy* soveschaniya. Kiev, Izd-vo AN UkrSSR, 1963, 149-158

TOPIC TAGS: steel, steel No. 45, steel 1Kh18N9T, steel 1Kh13, steel fatigue strength, steel energy dissipation, steel stress concentration sensitivity, plastically deformed bulk, fatigue strength, stress concentration.

ABSTRACT: A specially developed procedure, based on measuring the area of dynamic hysteresis loops, was employed to study energy dissipation in samples of variously heat-treated steels (No. 45, 1Kh18N9T, 1Kh13) in relation to levels of stress. The report also provides a comparison of energy dissipation characteristics with sensitivity to stress concentration. Test samples, procedure and equipment are described and schematically

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ACCESSION NR: AT4040398

illustrated. For the given stress range, i.e. 20 — 47 kg/mm^2, dissipation increased steadily in No. 45 and 1Kh18N9T steel from the fatigue limit on up. Sensitivity to stress concentration q was quite low (i.e. 0.31) for 1Kh18N9T, a steel characterized by high levels of energy dissipation, while steel No. 45 was quite sensitive (q = 1.0). It is concluded that the bulk of plastically deformed material varies significantly for different steels at stress levels equalling the fatigue limit. Hence that value cannot be used as a criterion of fatigue failure. An increase in the number of micro-volumes subject to plastic deformation results in an increased dissipation of energy and lowered sensitivity to stress concentration. Orig. art. has: 2 tables, 6 graphs and 5 formulas.

ASSOCIATION: none

SUBMITTED: 23Nov63 DATE ACQ: 07Jul64 ENCL: 00

SUB CODE: MM NO REF SOV: 007 OTHER: 004

Card 2/2

TROSHCHENKO, V.T.

Effect of the speed of applying loads on the strength characteristics of a number of ceramic metals. Porosh. met. 3 no.1:26-32 Ja-F '63. (MIRA 16:3)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.
(Ceramic metals--Testing)

TROSHCHENKO, V.T.

Strength of porous ceramic metal materials. Poroshk.met. 3 no.3: 3-11 My-Je '63. (MIRA 17:3)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

S/126/63/015/003/012/025
B193/B383

AUTHOR: Troshchenko, V.T.

TITLE: On the problem of nonuniformity of deformation in polycrystalline aggregates

PERIODICAL: Fizika metallov i metallovedeniye, v. 15, no. 3, 1963, 410 - 418

TEXT: The object of the present investigation was to study the laws governing fatigue and scattering of energy in a material in relation to nonuniformity of deformation. The experimental materials included: heat-treated steel 45 (UTS 67.5 kg/mm^2, δ = 17.0%); heat-treated steel 1Kh3-9T (1Kh10N9T) (UTS 52.7 kg/mm^2, δ = 54%); steel 1Kh (1Kh) hardened and tempered either at 430 °C (UTS 134.5 kg/mm^2, δ = 14.5%) or at 780 °C (UTS = 71 kg/mm^2, δ = 17.0%); sintered, low-carbon (0.05 %) steel powder compacts with porosity ranging from 15 to 37%, UTS from 17.7 to 6 kg/mm^2 and δ from 10.9 to 4.9%. Accurate stress-strain diagrams were constructed for all the materials studied, the fatigue limit was determined on notched and unnotched specimens tested in pure bending, and scattering of energy was evaluated from the dynamic

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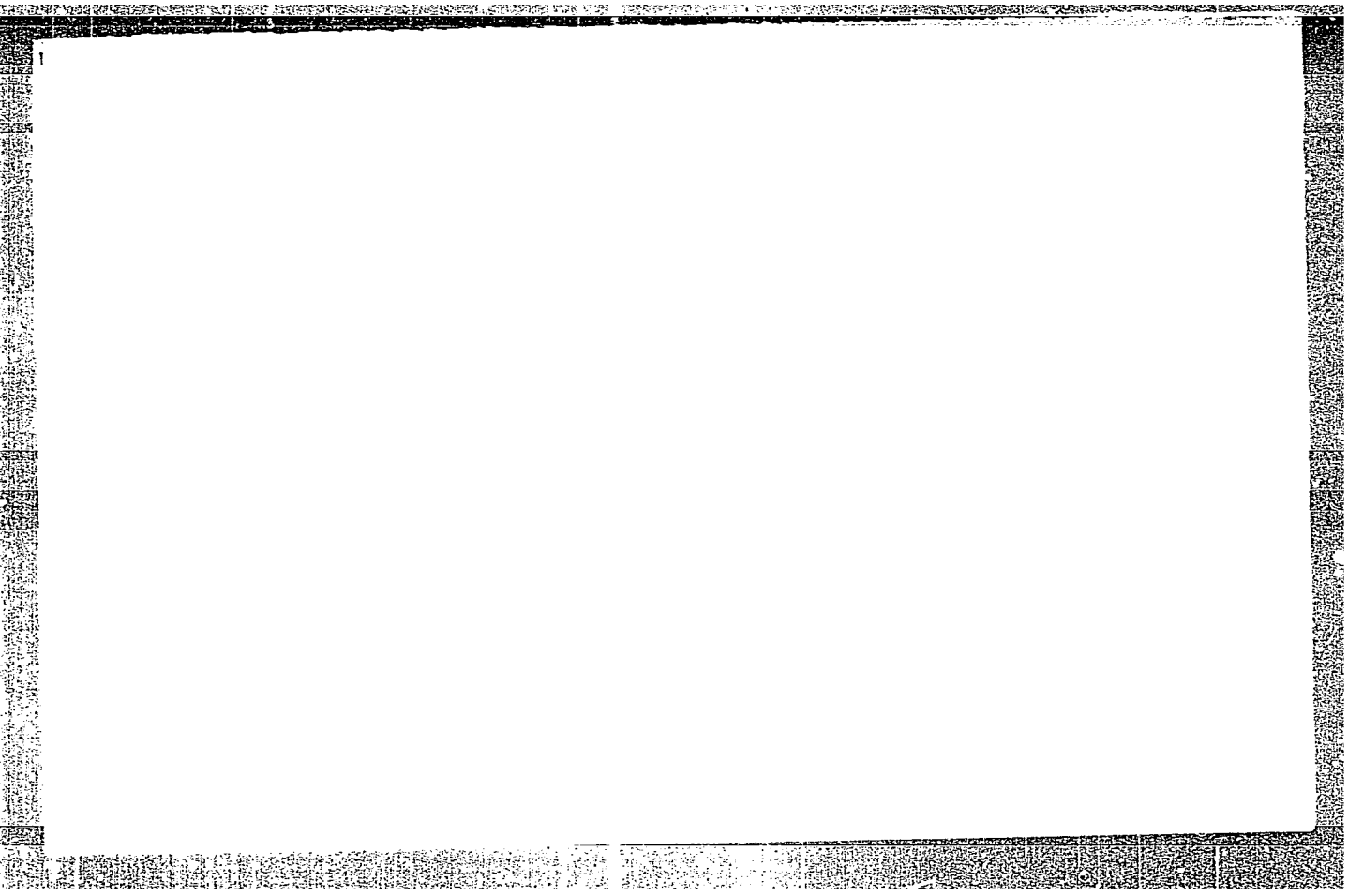
On the problem of ....

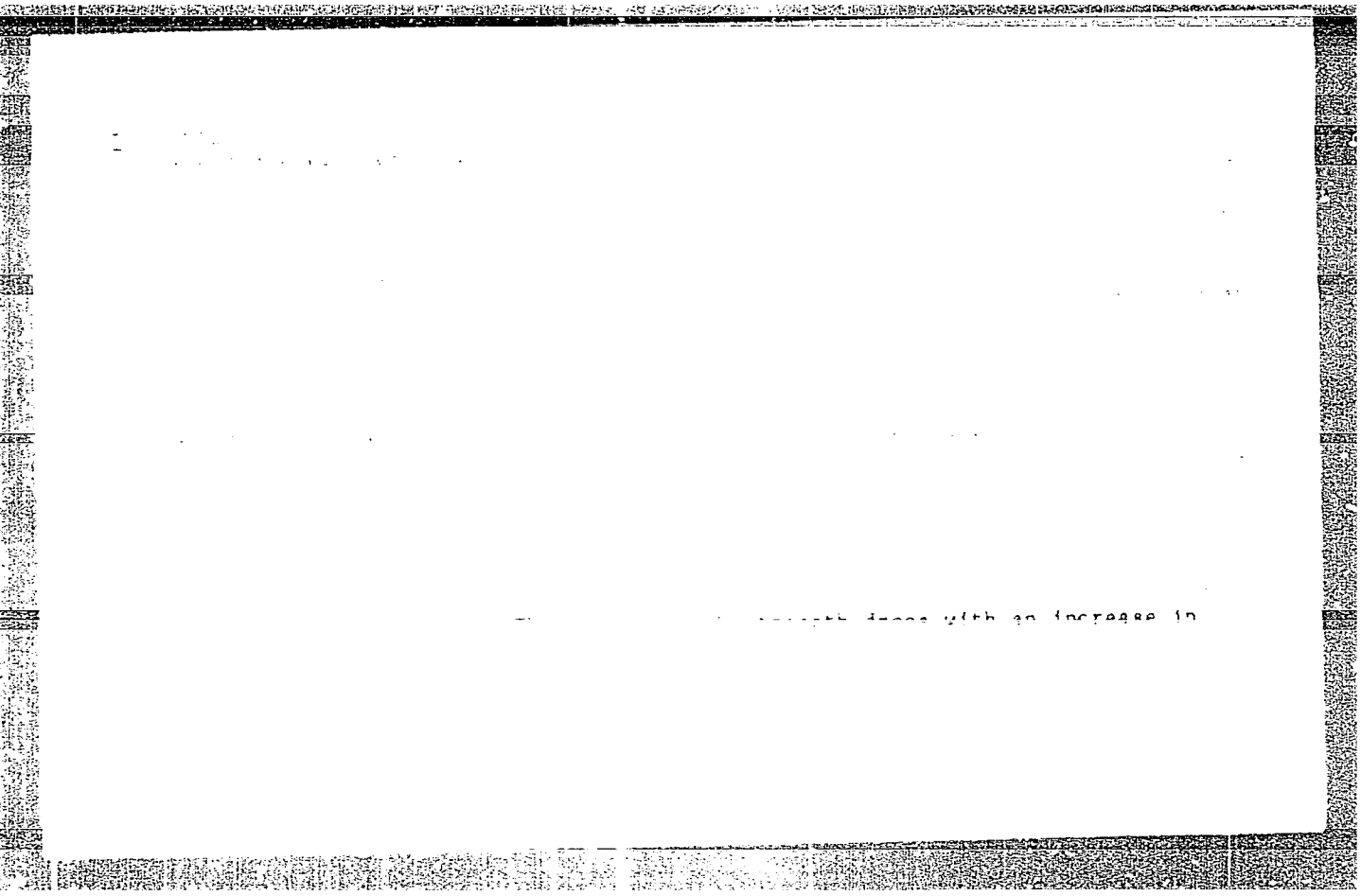
hysteresis loops of specimens vibrating in bending. Conclusions - 1) Since the proportion of plastically deformed material in specimens under a stress equal to the yield point of the material differs considerably from steel to steel, this characteristic cannot be used as a criterion of the fatigue fracture. 2) There is a direct relationship between nonuniform stress distribution in the microvolumes of a material and its notch sensitivity: as the degree of nonuniformity of stress distribution increases, the notch sensitivity decreases. This observations is in agreement with the statistical theory of fatigue metals due to Afanas'yev (Statisticheskaya teoriya ustalostnoy prochnosti metallov - Statistical theory of the fatigue strength of metals - Izd.AN UkrSSR, 1953) 3) The scattering of energy in steels 45 and 1Kh18N9T increases with increasing stress, the effect being more pronounced in more heterogeneous materials, particularly steel 1Kh18N9T. There are 6 figures and 5 tables.

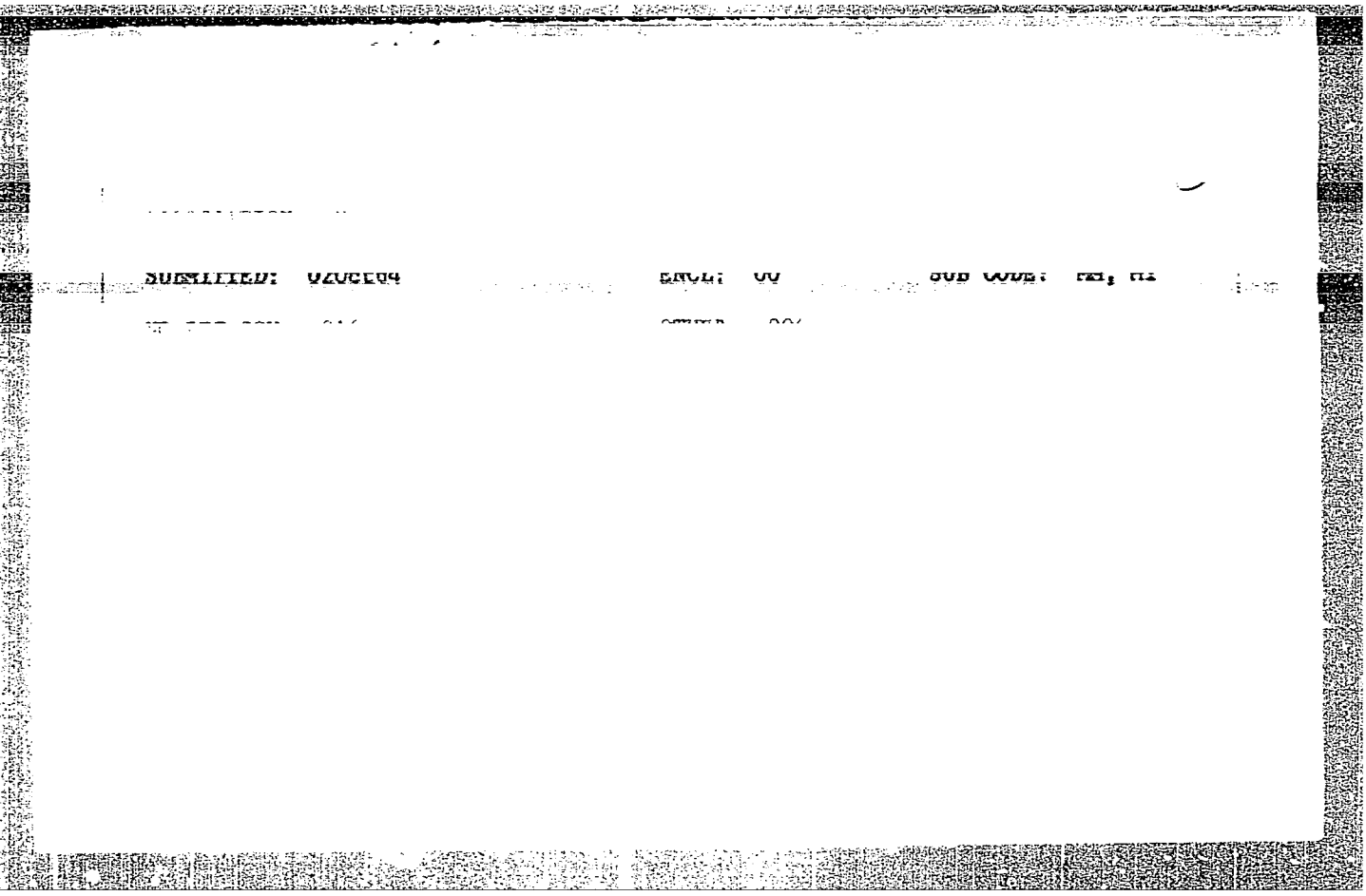
ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute of Powder Metallurgy and Special Alloys of the AS UkrSSR)

SUBMITTED: March 20, 1962 (initially), June 21, 1962 (after revision)

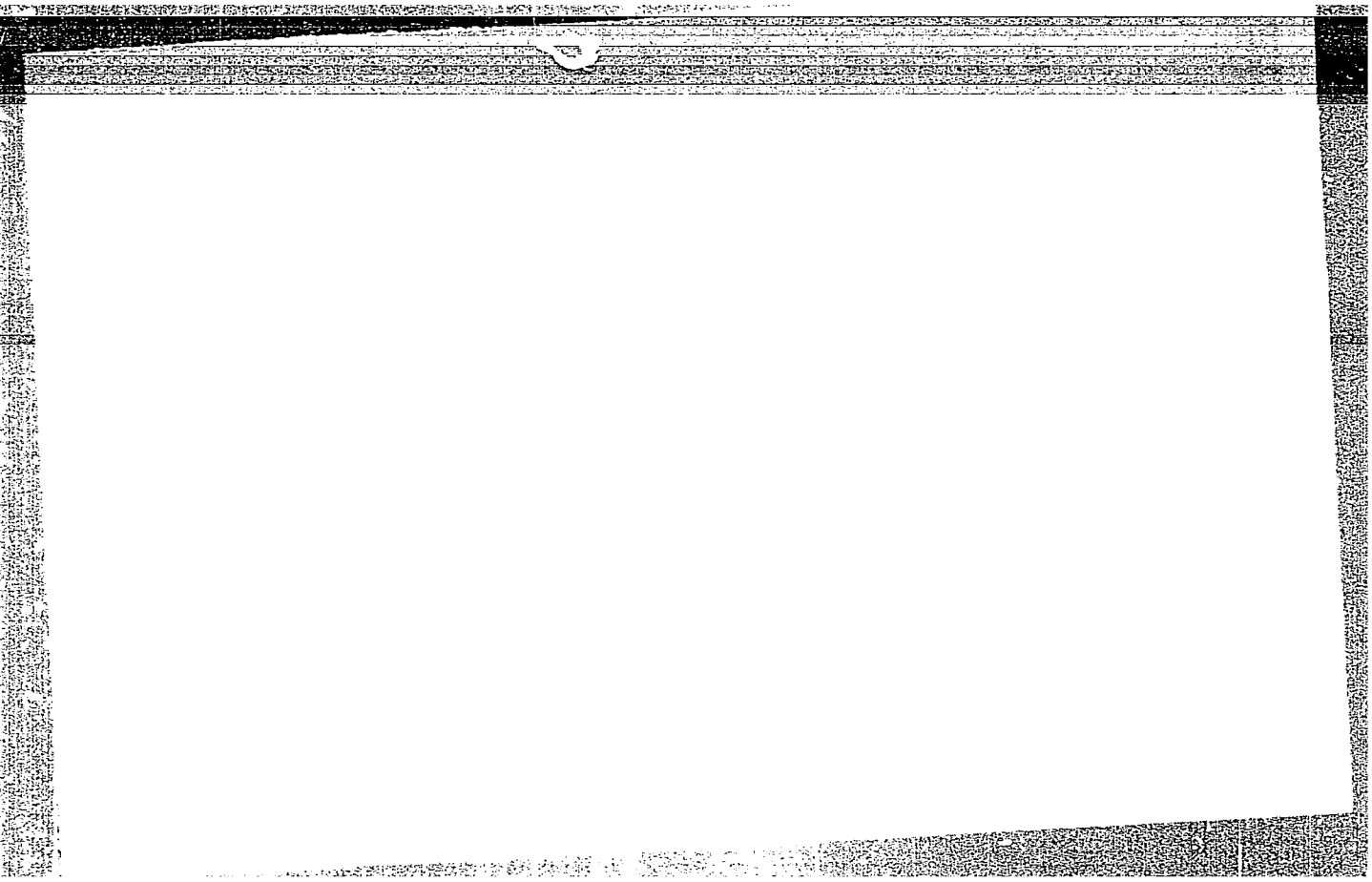
Card 2/2







APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001756730005-7"



APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001756730005-7"

VISHNEVSKIY, V.K.

Investigation of the deformability of porous ceramic metal materials during tensile testing. Poroshk. met. 5 no.1:52-59 '65. (MIRA 18:10)

1. Institut problem materialovedeniya AN UkrSSR.

TROSHCHENKO, V.T.; KRASOVSKIY, A.Ya.

Strength of porous iron during repeated alternating loading. (MIRA 18:5)
Porosh. met. 5 no.5:87-92 My '65.

1. Institut problem materialovedeniya AN UkrSSR.

PISARENKO, G.S.; TROSHCHENKO, V.T.; KRASOVSKIY, A.Ya.

Investigating the mechanical properties of porous iron under the effect of tension and torsion. Report no.1. Poroshk.met. 5 no.6:42-48 Je '65. (MIRA 18:8)

1. Institut problem materialovedeniya AN UkrSSR.

PISARENKO, G.S.; TROSHCHENKO, V.T.; KRASOVSKIY, A.Ya.

Investigating the mechanical properties of porous iron under the effect of tension and torsion. Porosh. met. 5 no.7:88-96 Jl '65. (MIRA 18:8)

1. Institut problem materialovedeniya AN UkrSSR.

Card 1/1

with increasing specimen length and with increase of cross-sectional area, it is greater for the larger volume samples; c) the standard deviation with long samples was much larger than that with short samples. The calculated results agreed well with the experimental results. Orig. art. has: 3 figures, 5 formulas, and 2 tables.

ASSOCIATION: Institut problem materialovedeniya Akademii nauk UkrSSR (Institute of Material Behavior Problems of the Academy of Sciences UkrSSR)

SUBMITTED: 00 ENCL: 02 SUB CODE: MM

NO REF SOV: 003 OTHER: 001

Card 2/4

L 27300-65
ACCESSION NR: AP5002180

ENCLOSURE: 01

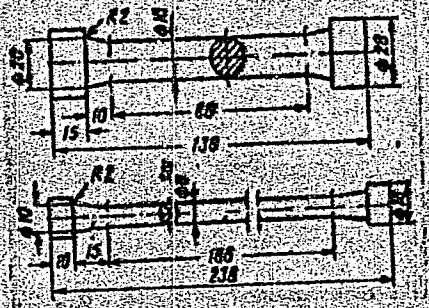


Fig. 1. Specimen dimensions

Card 3/4

L 27300-65
ACCESSION NR: AP5003180

ENCLOSURE: 02

PISARENKO, G.S. [Pysarenko, H.S.], akademik; TROSHCHENKO, V.T.; BUGAY, V.I. [Buhai, V.I.]

Correlation between the values of the fatigue limit and the strength characteristics of metals. Dop. AN URSR no.2:187-190 '65. (MIRA 18:2)

1. Institut problem materialovedeniya AN UkrSSR.
2. AN UkrSSR (for Pisarenko).

TROSHCHENKO, Valeriy Trofimovich, kand. tekhn. nauk; RUDENKO, Vasiliy Nikitich, kand. tekhn. nauk; KOVALEV, K.V., kand. tekhn. nauk, retsenzent

[Strength of ceramic metal materials and methods of determining it] Prochnost' metallokeramicheskikh materialov i metody ee opredeleniia. Kiev, Tekhnika, 1965. 187 p. (MIRA 18:12)

L 21818-66 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(...

ACC NR: AT6008660 (N) SOURCE CODE: UR/0000/65/000/000/0160/0169

EM/JD/EM/GS

AUTHORS: Bugay, V. I. (Kiev); Pisarenko, G. S. (Academician AN UkrSSR) (Kiev); Troshchenko, V. T. (Kiev)

62
56
B+1

ORG: none

TITLE: A study of inelastic deformations in metals under cyclic deformation

SOURCE: Vsesoyuznoye soveshchaniye po voprosam staticheskoy i dinamicheskoy prochnosti materialov i konstruktsionnykh elementov pri vysokikh i nizkikh temperaturakh, 3d. Termoprochnost' materialov i konstruktsionnykh elementov (Thermal strength of materials and construction elements); materialy soveshchaniya. Kiev, Naukova dumka, 1965, 160-169

circuit design

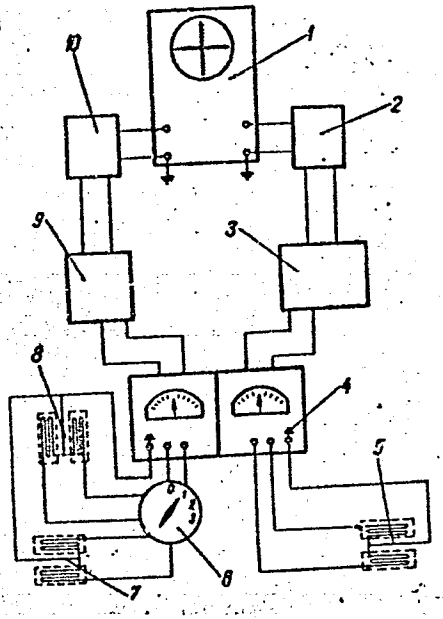
TOPIC TAGS: /fatigue strength, metal stress, strain, plastic deformation, hysteresis loop, copper, steel / 45 steel, 25 steel, 20Kh steel, EI726 steel, 1Kh18N10T steel, TsDM PU-10 testing machine

ABSTRACT: The course of plastic deformations in metals and alloys as a function of the stresses and number of loading cycles is studied. The work was done to obtain criteria for the fatigue strength of materials. A system developed earlier by V. T. Troshchenko (Novyye mashiny i prabory dlya ispytaniya metallov, M., Metallurgizdat, 1963) underlies the method. The 10-ton East German TsDM PU-10 machine was used for mechanical loading of up to $P_a = \pm 49$ kN. The frequency can be varied smoothly from

Card 1/3

500 to 2000 cycles per minute. A dynamic hysteresis loop in coordinates proportional to σ and ε is obtained on the screen of an oscillograph during testing (see Fig. 1).

Fig. 1. Circuit for recording dynamic hysteresis loops with cyclic variable loading: 1 - oscillograph; 2, 10 - filters; 3 - amplifier; 4 - tensostation; 6 - PMT switch; 5, 7, 8, 9 - resistance pickups.



L 21818-66

ACC NR: AT6008660

Copper and 45, 25, 20Kh, EI726, and 1Kh18N10T steels were tested (see Fig. 2).

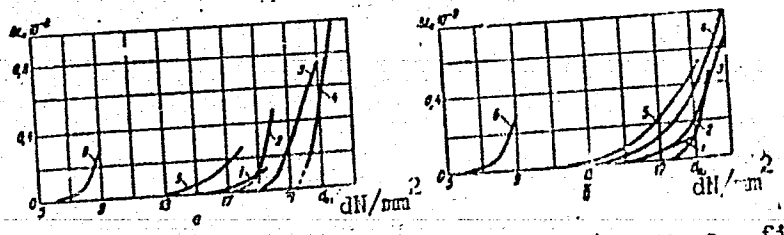


Fig. 2. Change in width of hysteresis loop versus stress: a - first loading; b - second loading; 1 - EI726; 2 - 25 steel; 3 - 20Kh steel; 4 - 45 steel; 5 - 1Kh18N10T steel; 6 - copper.

With cyclic stress and strain, opening of the hysteresis loop for the steels tested is observed with much smaller stresses than with static loading. For the steels, with stresses exceeding the fatigue limit, the width of the hysteresis loop increases regularly with the number of loading cycles until destruction of the specimen. Orig. art. has: 2 diagrams, 3 graphs, 2 photographs, 2 tables, and 4 formulas.

SUB CODE: 20, 11/SUBM DATE: 19Aug65/ ORIG REF: 002

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L 38114-66 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) EM/JD/HW

ACC NR: AP6010089 (A) SOURCE CODE: UR/0129/66/000/003/0018/0022

AUTHOR: Pobirovskiy, V. I.; Troshchenko, V. T.

ORG: Institute for Materials AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Sensitivity to stress concentration of type ShKh15 steel after different heat treatments

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1966, 18-22

TOPIC TAGS: stress concentration, metal heat treatment, low alloy steel

ABSTRACT: A table gives the chemical composition of type ShKh15 steel, which is as follows: 0.01% carbon; 0.3% manganese; 0.1% silicon; 1.4 chromium; 0.07 nickel; 0.006% sulfur; 0.010% phosphorous. Heat treatment was carried out under three sets of conditions: 1) quenching from 840°C in oil, annealing at 170°C, holding time 3 hours; 2) quenching from 840°C in oil, annealing at 510°C, holding time 2 hours; 3) quenching from 840°C in oil, annealing at 650°C, holding time 2 hours. The structure of the steels worked under the first set of conditions consists of martensite, residual austenite, and carbides. Steels worked under

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L 38114-66

ACC NR: AP6010089

2

conditions 2 and 3 do not contain martensite. The mechanical properties of the steels are given in a table. In general, it was found that the sensitivity of steel ShKh15 to stress concentration depends to a great degree on the method used to prepare the concentrates. It was established that the dependence of the plastic deformation at stresses equal to the fatigue limit on the hardness in the region of high hardness corresponds to the results obtained for samples prepared by the second method mentioned above. For all the degrees of hardness investigated, there was also observed a correlation between the sensitivity to stress concentration and the quantitiy σ_v/σ_p. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 001

Card 2/2

UR/

ACC NR: AM6004546 (A) Monograph

Troshchenko, Valeriy Trofimovich (Candidate of Technical Sciences); Rudenko, Vasiliy Nikitich (Candidate of Technical Sciences)

Durability of metal-ceramic materials and methods of testing it (Prochnost' metalloke ramicheskikh materialov i metody yeye opredeleniya) Kiev, Izd-vo "Tekhnika", 65. 0187 p. illus., biblio. 2,000 copies printed.

TOPIC TAGS: ceramic product, ceramic product property, ceramic wear material, high temperature ceramic material, ceramic technology,

PURPOSE AND COVERAGE: This book summarizes the general knowledge of purpose of technology of processing, use and physical and technological properties of metal-ceramic materials. The results are given of deformation and disintegration of similar materials; and their explanation is given, based on the statistical theory of durability. The methods are described of technological testing of metal-ceramic materials at room and high temperatures. Special attention is given to high-melting metal-ceramic materials containing small amount of plastic at a very high temperatures (up to 3000°K). The book is intended for engineers and scinetists studying the properties of metal-ceramic materials, as well as their introduction into industry, and for students at higher technical institutes.

TABLE OF CONTENTS (abridged):

UDC:621.775.74

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ACC NR: AM6004546

Ch. I. Basic principles of deformation and breaking up of metal-ceramic materials--64

Ch. II. Methods of determining the durability and plasticity of metal-ceramic materials--119

Bibliography--181

SUB CODE: // SUBM DATE: 21Aug65/ ORIG REF: 095/ OTH REF: 021

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ACC NR: AP7001426 SOURCE CODE: UR/0413/66/000/021/0144/0144

INVENTOR: Troshchenko, V. T.; Uskov, Ye. I.

ORG: none

TITLE: Unit for investigating the effect of frequent temperature changes on the strength and creep of refractory metals and alloys in an inert medium. Class 42, No. 188103 [announced by the Institute of Problems of Material Study AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 21, 1966, 144

TOPIC TAGS: refractory metal, refractory alloy, ~~metal~~ fatigue strength, ~~metal~~ creep, ~~temperature change metal resistance~~, ~~metal resistance heat treating unit~~ vacuum chamber, metallurgic testing machine

ABSTRACT: This Author Certificate introduces a unit for investigating the effect of repeated temperature changes on the strength and creep of refractory metals and alloys in an inert medium. The unit includes a vacuum chamber which contains a heater and a rotary shaft carrying fixtures with specimens and loading devices. To enable simultaneous testing of several specimens at a programmed temperature change, the unit is equipped with a cooling device located in the vacuum chamber in a certain distance from the heater and a programming device which controls the temperature change. A constant stress in the specimen is created by springs.

Orig. art. has: 1 figure.

SUB CODE: 13, 11, 14/ SUBM DATE: 21Jun65/ UDC: 620.171.32

Card 1/1

TROSHCHENKO, V.T.; BUGAY, V.I.

Durability of steels as dependent on the plastic per cycle deformation under conditions of uniform and nonuniform stressed states. Zav. lab. 31 no. 12:1501-1503 '65 (MIRA 19:1)

1. Institut problem materialovedeniya AN UkrSSR.

NOVIKOV, N. V., kand. tekhn. nauk; TROSHCHENKO, V. T.; POBIROVSKIY, V. I.

Study of strength and damping properties of some materials used by the turbine industry. Energomashinostroenie 8 no.12: 30-33 D '62. (MIRA 16:1)

(Turbines)

S/114/62/000/012/006/007
E194/E535

AUTHORS: Novikov, N.V., Candidate of Technical Sciences, Troshchenko, V.T. and Pobirovskiy, V.I., Engineer

TITLE: Investigation of the fatigue strength and the damping properties of some materials used in turbine engineering

PERIODICAL: Energomashinostroyeniye, no. 12, 1962, 30 - 33

TEXT: Investigations were carried out on the steels 1Kh13 (1Kh13) (hardened from 1 000 °C, oil-quenched, followed by tempering at 430, 630 and 750 °C, respectively), OKhN1MFA (OKhN1MFA) (hardened in oil from 870 °C, then tempered at 600 °C and air-cooled), OKhN3MFA (OKhN3MFA) (hardened from 850 °C in oil, followed by tempering at 680 °C and cooling in air) and the titanium alloy 48-OT3 (48-OTZ) (annealed at 830 °C for two hours followed by cooling air). In the experiments, the effects of temperature (20 - 500 °C), cycle asymmetry, stress concentration, surface quality as well as the irreversible energy dissipation in the material during vibration were taken into account. The fatigue limit of the steel 1Kh13 decreased appreciably from 500 °C upwards; for the steel OKhN3MFA the fatigue limit began to

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Investigation of ....

decrease from 400 °C upwards. The maximum stress of the cycle in excess of the yield point of the material did not lead to an appreciable drop in the fatigue limit of the steel 1Kh13 (specimens tempered at 750 °C). The surface quality had a considerable influence on the fatigue limit of the steel 1Kh13, particularly at room temperature and especially for specimens subjected to low-temperature tempering; in this case, the fatigue limit increased by 45% as a result of increasing the surface quality from class 4 to class 11. The effect of the surface quality decreased with temperature. For the steel 1Kh13, tempered at 750 °C, the energy dissipation of the material was high and decreased with decreasing tempering temperature; the behaviour was somewhat unusual in as much that in a certain range it increased with decreasing stress; this was attributed to magnetostriction effects and magnetomechanical hysteresis associated therewith. An intensive increase in the logarithmic damping decrement began from 500 - 550 °C with increasing temperature, regardless of heat treatment. A lowering of the energy dissipation in the temperature range 400 - 500 °C was attributed to dispersion-hardening. For the

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S/114/62/000/012/006/007
E194/E335

Investigation of ....

steels CKhN1MFA and OKhN3MFA the logarithmic damping decrement increased almost linearly with increasing stress and temperature; a sharp increase in the logarithmic damping decrement was observed above 400 - 450 °C. It was established that there was a definite relationship between the fatigue failure and the change in the logarithmic damping decrement of the steels investigated. The fatigue limit dropped considerably in the same range in which a sharp increase in the logarithmic damping decrement was observed. The sensitivity of the steels to cycle asymmetry increased with increasing value of the latter and their sensitivity to stress-concentration and to surface quality decreased. There are 5 figures and 4 tables.

Card 3/3

TROSHCHENKO, V.T.

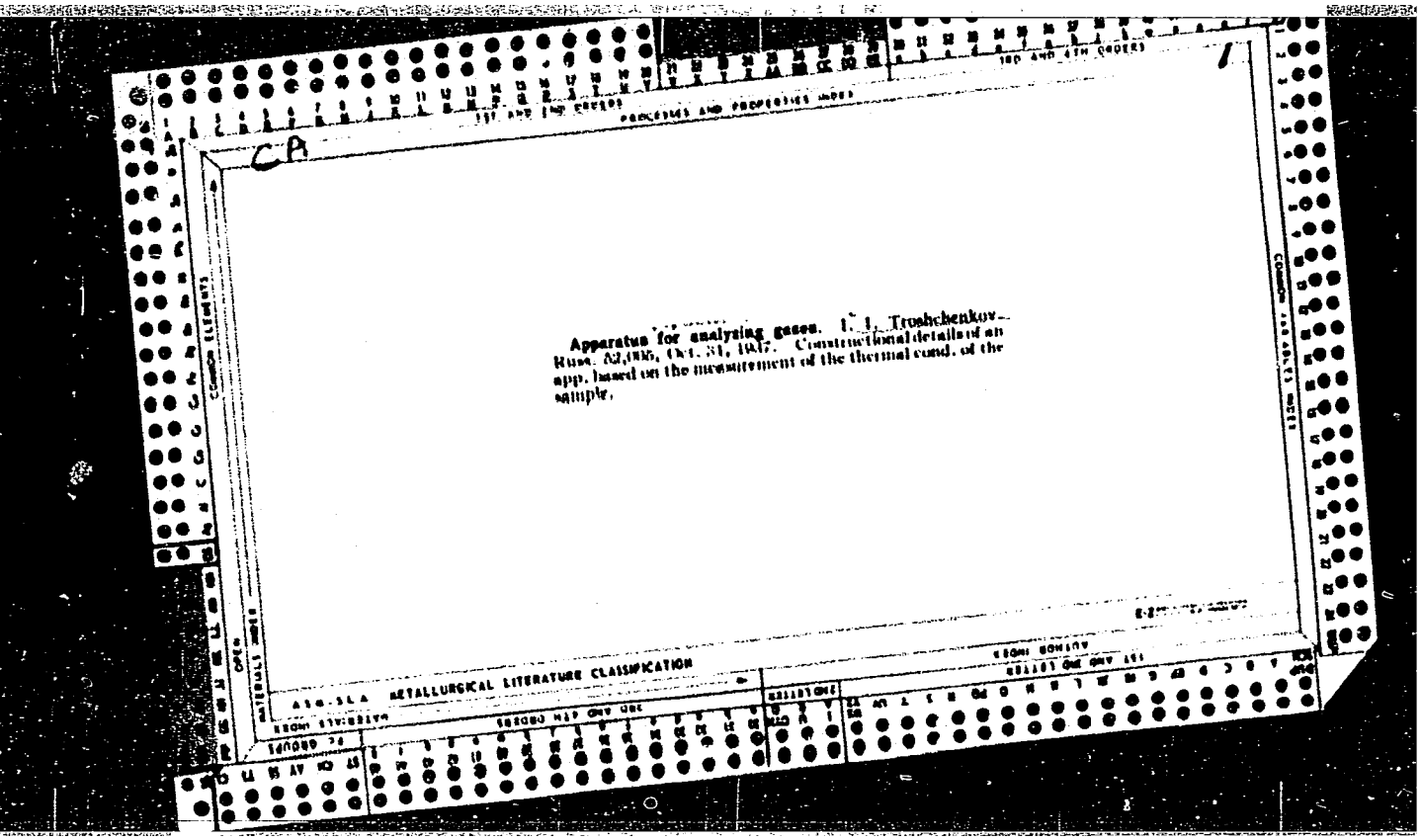
Effect of the nonuniformity of distribution of porosities in the cross section of a specimen on its strength characteristics. Porosh. met. 4 no.6:71-78 N-D '64. (MIRA 18:3)

1. Institut problem materialovedeniya AN UkrSSR.

TROSHCHENKOV, I.I.

SMIRNOV, Aleksey Aleksandrovich; TROSHCHENKOV, I.I., redaktor; DOLMATOV, P.S., vedushchiy redaktor; GENNAD'YEVA, I.M., tekhn. redaktor.

[Repair of heat regulators; a practical reference manual] Remont reguliatorov teplovykh protsessov; spravochnoe prakticheskoe rukovodstvo. Leningrad, Gos. nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1957. 654 p. (MIRA 10:12)
(Thermostat--Maintenance and repair) (Automatic control)
(Heat)



PIVEN', Viktor Danilovich, doktor tekhn. nauk, prof.; BOGDANOV, Valentin Kirillovich; GANZHERLI, Emmanuil Il'ich; ZAMANSKIY, Abram Markovich; TROSHCHENKOV, I.I., retsenzent; CHERKASOV, K.I., red.

[Automation of power generating systems] Avtomatizatsiia energeticheskikh blokov. Pod obshchei red. V.D.Piven'. Moskva, Energiia, 1965. 351 p. (MIRA 19:1)

TROSHCHENKOV, N.A., inzh.; TILIK, V.T., inzh.; MIRENSKIY, Yu.M., inzh.

"Metals for sheet-metal work" by V.P.Severdenko, S.A.Pasechnyi. (MIRA 16:2)
Stal' 23 no.1:89 Ja '63.

1. Zavod "Zaporozhstal'".
(Sheet-metal work) (Steel, Automobile)

KSENZUK, F.A., inzh.; AVRAMENKO, I.N., inzh.; MIRENSKIY, Yu.M.; TROSHCHENKOV, N.A.

Relation between the degree of deformation and the speed and tension during the straightening of sheet steel for automobiles. Stal' 25 no.7:632-634 Jl '65. (MIRA 18:7)

1. Zavod "Zaporozhstal'".

YASHNIKOV, D.I., inzh.; TILIK, V.T., inzh.; TROSHCHENKOV, N.A., inzh.; Prinimali uchastiye: SAMOYLOV, I.D., inzh.; VERBITSKIY, A.I., inzh.; KRASNIKOV, A.S., inzh.; BURBELO, V.G., inzh.; KSENZUK, F.A., inzh.; MIRKINA, R.Ye., inzh.; GOL'DSHTEYN, F., inzh.; BOZHKO, S.A., inzh.

Reducing the consumption of tin in improving the microgeometry of sheet iron surfaces. Stal' 21 no.9:862-864 S '61. (MIRA 14:9)

1. Zavod "Zaporozhstal'".
(Tinning) (Surfaces (Technology))

YUDIN, M.I.; TROSHCHENKOV, N.A.

Polished stainless steel plates. Metallurg 6 no. 1:21-23 Ja '61.

1. Nachal'nik tsekha kholodnoy prokatki zavoda "Zaporozhstal'" (for Yudin). 2. Rukovoditel' prokatnoy gruppy tsentral'noy zavodskoy laboratorii zavoda "Zaporozhstal'" (for Troshchenkov).
(Plates, Iron and steel) (Grinding and polishing)

FILONOV, V.A., inzh.; YUDIN, M.I., inzh.; TROSHCHENKOV, N.A.; MOVSHOVICH, V.S.

Improving the procedure for the manufacture of cold-rolled sheet alloyed steel. Stal' 20 no. 12:1116-1118 D '60. (MIRA 13:12)

1. Zavod "Zaporozhstal'."
(Rolling (Metalwork))

S/130/61/000/001/003/006
A006/A001

AUTHORS: Yudin, M. I., Chief of the Cold Rolling Shop, Troshchenkov, N. A., Chief of the Rolling Group TsZL

TITLE: Stainless Steel Ground Plates

PERIODICAL: Metallurg, 1961, No. 1, 1961, pp. 21-23

TEXT: In connection with the development of polished plastic articles, manufactured by pressing, the demand of polished and ground stainless steel backing plates is continuously increasing. The production of ground stainless steel plates was started at "Zaporozhstal'" in 1957, using the ШПМ-1500 (ShPM-1500) grinding machines. The authors together with M. M. Stekachev, L. A. Zagadchenko and G. A. Drobot investigated the effect of individual technological parameters on the surface of the finished plates and revealed deficiencies in the design of the aforementioned machine. Heat treated, etched 1Х18Н9Т (1Kh18N9T), 1Х18Н9 (1Kh18N9) and 2Х18Н9 (2Kh18N9) steel sheets, and quenched and etched cold-worked 1Kh18N9T steel blanks were used. Since the quality of the ground plates depends on the surface conditions of the blanks, measures were taken to improve the quality of the blank surface. For this purpose water glass used as a binding material on abrasive

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S/130/61/000/001/003/006
A006/A001

Stainless Steel Ground Plates

belts was replaced by hide glue and the following optimum conditions for grinding the plates wer established: 1) rough grinding with 100 mesh abrasive material; 2) pre-finishing grinding with 150 mesh abrasive and 3) finishing grinding with 180 mesh abrasive powder. Electrocorundum was found to be the best abrasive material. The abrasive powder was applied to the belt by a special device consisting of a sheet metal container with four rolls - two for tightening the belt and two for applying and levelling the abrasive material. The ShPM-1500 belt-type machine consists of a feed and a grinding mechanism. The sheet to be ground is sucked on to a perforated feed belt by a vacuum pump retaining the work on the belt during its processing with the abrasive belt. The feed belt moves at a speed of 3.2 - 11 m/min. The grinding mechanism consists of three rolls onto which an endless 1 mm thick, 1300 mm wide abrasive belt is fastened. The abrasive belt moves at a speed of 10 m/sec. The belt is pressed against the work piece with four 100-mm diameter steel rolls. The grinding operation can be switched over to the vertical direction. Experience gathered in the production of stainless steel ground plates by the aforementioned method has led to the following conclusions. 1. The quality of finished plates depends in the first place on the quality of cold and hot rolled blanks. There should not be any visible defects on the blank surface, since their elimination would require the removal of a thick metal layer. This would extend

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the grinding process and impair the quality of the ground surface. 2. The existing method of applying the abrasive material and the glue to the belt by manual pulverization does not assure a uniform covering of the belt with the material on its whole length and width. Therefore mechanical processes of applying the abrasive powder should be developed. 3. The rubberized transportation belts do not yield satisfactory results due to different thickness across their section (2 - 4 mm at a 12-mm thick belt); non-admissible expansion during operation (up to 10%); cracking and scaling of the upper coating. 4. The endless woolen abrasive belts produce considerable non-uniform longitudinal stretching (up to 15%) causing cracking of the abrasive coating and breakdown of the belt. Inclusions of foreign material in the belts produce scratchings on the surface to be ground. 5. The grinding machine described has a series of deficiencies and cannot be recommended for the grinding of large size sheets. Designs of machines should be developed for the grinding of sheets on both sides by taking into account domestic and foreign experiences. 6. Large scale production of ground plates should be performed in special shops, starting with cold rolling of blanks. There are 3 figures.

ASSOCIATION: Zaporozhstal' Plant

KSENZUK, F.A., inzh.; MIRENSKIY, Yu.M., inzh.; TROSHCHENKOV, N.A., inzh.

Changes in steel properties depending on the degree of reduction during coil straightening. Stal' 24 no.1:56-58 Ja '64. (MIRA 17:2)

1. Zavod "Zaporozhstal'".

YUDIN, M.I.; KOMANOVSKIY, A.Z.; TROSHCHENKOV, N.A.

Redesign of the 1618 continuous cold rolling mill. Metallurg 8 no.11:28-29 N '63. (MIRA 16:12)

KSENZYK, F.A., inzh.; TROSHCHENKOV, N.A., inzh.

Reasons of blister formation on cold-rolled 08kp steel sheets. Stal' 21 no.3:274-276 Mr '61. (MIRA 14:6)

1. Zavod "Zaporozhstal'."
(Sheet steel--Defects)

S/133/61/000/003/013/014
A054/A033

AUTHORS: Ksenzuk, F. A., Engineer; Troshchenkov, N. A., Engineer

TITLE: The causes of blister formation on 08kp (08kp) cold-rolled steel sheets

PERIODICAL: Stal', no. 3, 1961, 274 - 276

TEXT: There are many rejects among the cold rolled 08kp steel sheets principally used for gasoline containers and car bodies, on account of blister formation. The blisters (1 - 5 mm wide, 2 - 50 mm long) are as a rule found after annealing on the surface, in the sheet centre 200 - 250 mm from the edges. Upon studying the microstructure of 164 specimens from 19 heats it was established that blisters mainly form in those parts of the sheets which contain a large quantity of non-metallic (siliceous) inclusions and especially, when these inclusions are near the surface. According to Ref. 1 (G. K. L'vov: Metallographic Principles of Producing Thin Steel Sheets, Khar'kov-Moscow, Metallurgizdat, 1949) and Ref. 2 (E. Gudremon: Theory of Special Steels, ONTI, 1937) blisters are caused by the hydrogen diffusion in iron during pickling. Therefore the effect of the pickling

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The causes of blister formation ....

time on hot rolled strips before cold rolling, as well as the casting technology in general were investigated. The pickling assembly used in the tests consisted of four sulfuric acid baths with a concentration of 18, 18, 12 and 9 %, respectively. The pickling speed varied between 40 m/min and 10 m/min. At max. pickling speed holding time in bath 1.8 min and at min. pickling speed holding time in bath 7.2 min. the following results were obtained:

Heats	3773 3923	61079	4929	101144	51046
Sheets rejected on account of blisters, % ...	11.9 0.0	0.0 0.0	2.1 0.0	10.0 0.6	1.6 2.8

The tests show that neither the composition, nor the temperature of the bath affected blister formation, only the speed at which the strip passed through the bath, (at top speed about 9 times more blisters were formed than at low speed). However, blister formation cannot be eliminated entirely, even at low pickling speeds. In order to determine the effect of the pouring technology on the formation of non-metallic impurities and, consequently, of blisters, the method and the rate of casting were closely

The causes of blister formation

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A054/A033

followed. In the tests the metal was additionally impurified by chamotte powder or by not removing the slag. The greatest amount of blisters was found in sheets rolled from the lower part of slabs, made from bottom-poured metal. It is supposed that with bottom poured metal the lower part of the ingot is contaminated by impurties consisting of refractory material that has been dislodged and carried along , and of substances used in assembling the bottom board. When the pouring speed was increased, for instance by pouring two molds at the same time, blister formation was somewhat lower. In sheets from slabs produced by top-pouring the amount of siliceous inclusions and consequently blister formation was considerably less. As a result of the tests, refractory material of the highest quality should be used when casting low-carbon rimmed steel, which has to comply with particularly high standards, and the assembly of the bottom board has to be subjected to a very severe control. In this way blister formation could be reduced to a minimum. In the tests I. S. Marakhovskiy, I. L. Zlatkin, A. I. Marinov, A. I. Koshik, V. N. Lola, L. A. Zagadchenko, Engineers participated. There are 2 figures and 3 Soviet references.

ASSOSIATION: Zavod "Zaporozhstal'"("Zaporozhstal'" Plant)

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S/133/60/000/012/009/015
A054/A027

1.1300

AUTHORS: Filonov, V.A., Engineer, Yudin, M.I., Engineer, Troshchenkov, N.A., Engineer, and Movshovits, V.S., Engineer

TITLE: Improved Production Process for Cold Rolled Alloy Steel Sheets

PERIODICAL: Stal', 1960, No. 12, pp. 1116-1118

TEXT: Until recently the production of the alloyed steel sheets, 0.5-3.0 mm thick, in the Zaporozhstal' Plant was divided into 8 stages. The technology had certain drawbacks: because the sheets had to be moved about a great deal during processing, their surface defects were numerous: 16.6-25.1% were defective, moreover, it was not possible to obtain the required mechanical properties. About 30% of the sheets had to be rejected because the strength limit was too low. In order to simplify and at the same time to improve this process, cold rolling tests were made with 12Г2А (12G2A), 25ХГСА (25KhGSA), 30ХГСА (30KhGSA) and other steel sheets, 0.8-3.0 mm thick, omitting bright annealing, i.e., the second phase of the conventional production process. The tests were carried out on a 1,680 mm stand, at a maximum rolling speed of 3.95 m/sec and it was found that the 12G2A steel sheets, 0.8-3.0 mm thick and 730-1,270 mm wide could easily be rolled in 3-7 passes. The cold rolling of 25KhGSA and 30KhGSA steel sheets without bright annealing was only possible up to 1.2-3.0 mm thickness, irrespective of the strip width, with normal metal

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Improved Production Process for Cold Rolled Alloy Steel Sheets

pressure at the rollers and with normal load on the main motor. Omitting bright annealing decreased rolling waste 2.2 times for the 12G2A and 3.2 times for the 25KhGSA and 30 KhGSA brand steels. Furthermore, tests were carried out with cold rolling steel sheets (12G2A) containing manganese up to 0.5 mm thickness, without bright annealing and intermittent annealing, on a 4-high reversible mill stand (1,200 mm) and it was established that by applying this technology wastage could be reduced 3.3 times as compared with the conventional method, while the metal pressure on the rollers was kept within the limits allowed (1,800 t) and by applying hydrogenated sunflower seed oil as a lubricator, the main motor load could be reduced. Maximum rolling speed attained 6.7 m/sec. Tests were also carried out to improve the annealing of hot rolled sheet coils of 23 Х 2НВФА (23Kh2NVFA), 17 Х 2НВФА (17Kh2NVFA), 12 Х 2НВФА (12Kh2NVFA), 25ХГСА (25KhGSA) and 30ХГСА (30KhGSA) steels and it was established that optimum conditions can be obtained by annealing unpickled sheet coils in a protecting atmosphere of nitrogen, containing not more than 0.5% CO_2, 4-6% CO and 4-6% H_2. Annealing takes place in this protecting atmosphere at 850°C for periods of 16,18,20 hours, depending on the weight of the charge, (≤ 6,7-8, 9-10 coils, respectively). By annealing in protective atmosphere it was possible

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to prevent decarbonization and to increase the output of the pickling equipment considerably by setting free great part of its capacity. Further improvement in the quality of cold rolled 12G2A steel sheets could be attained by normalizing the sheets in coils, in electric hood-furnaces with ventilators. The heat conditions of the process were the same as when normalizing the sheets in small packets (heating up to 840-860°C, holding time: 1 hour, furnace temperature 900°, cooling under muffle to 180°C); the improvement in mechanical properties was obtained by the special size and the construction of the furnace securing a uniform heating and cooling in the entire coil while waste due to inadequate mechanical properties could be eliminated. This waste had amounted to about 80% when normalizing in the conventional production process single packets. There is 1 table.

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Improved Production Process for Cold Rolled Alloy Steel Sheets

① Steel brand; ② Initial and final thickness of the strip mm; ③ Strip width mm; ④ Total reduction %; ⑤ Load on the main motor a; ⑥ Metal pressure on the roll ton; ⑦ Rolling speed m/sec; ⑧ Number of passes.

Марка стали 1	Исходная и конечная толщина полосы, мм 2	Ширина полосы мм 3	Суммарное обжатие % 4	Нагрузка главного двигателя a 5	Давление металла на валки m 6	Скорость прокатки м/сек 7	Количество пропусков 8
	Реверсивный стан 1680						
12Г2А	2,3—0,8	1270	65,1	1200—2800	1400—1700	1,17—3,44	7
		1020	65,1	800—3000	800—1100	1,57—3,52	5
	2,3—1,0	1270	56,5	1200—3000	1300—1700	1,57—3,71	5—7
		1020	56,5	1000—3400	900—1700	1,57—3,60	5—3
	2,3—1,2	1020	47,8	1000—3000	850—1500	0,78—3,52	
	2,7—1,5	1020	44,5	1600—2500	900—1100	1,76—3,52	
	3,2—2,0	1270	37,5	2000—3200	1200—1700	1,57—3,52	3
	3,7—2,5	1270	32,4	2000—3000	1400	2,54—3,14	
	4,0—3,0	1270	25,0	2000—3000	1400—1600	2,34—3,14	
		730	25,0	2000—2500	900—1100	2,34—3,14	

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TROSHCHENKOV, N.A., inzh.; ZAGADCHENKO, L.A., inzh.

Changes in the mechanical properties of steel under the effect of cold rolling. Stal' 20 no.8:735-738 Ag '60. (MIRA 13:7)

1. Zavod "Zaporozhstal'."
(Steel--Cold working)

S/133/60/000/008/009/013

AUTHORS: Troshchenkov, N. A., Zagadchenko, L. A., Engineers

TITLE: The Change in the Mechanical Properties of Steel During Cold Rolling

PERIODICAL: Stal', 1960, No. 8, pp. 735-738

TEXT: In order to investigate the changes in the mechanical properties and the hardness of steel as a function of the degree of deformation, cold-rolling tests were carried out with 08 кп (08kp), 10Г2 (10G2), 12Г2А (12G2A), 25Х1СА (25Kh1SA), 30ХГСА (30KhGSA), 12Х5МА (12Kh5MA), ЭИ659(EI659), Э3(E3), 1Х18Н9 (1Kh18N9), 1Х18Н9Т (1Kh18N9T) and ЭИ811 (EI811) grade steels. Before rolling the strips were subjected to a softening heat treatment, while the 08kp and 10G2 type steels were processed immediately after hot rolling. For cold rolling a reversing, four-roll mill was used, the diameter of the working rolls being 480 mm, that of the backing-up rolls 1,370 mm and the length of the roll body 1,680 mm with a motor output of 2,250 HP. From each type of steel one coil was rolled, thus attaining for one coil various steps of deformation. The degree of deformation varied between 5-15% for one pass. For

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The Change in the Mechanical Properties of Steel During Cold Rolling

lubrication spindle oil, for cooling the rolls a 5-7% mineral emulsion were applied. For each degree of deformation four (two transverse and two along the rolling) specimens were tested, in accordance with ГОСТ (GOST) 4197-42 and diagrams for the extensions were plotted. By analyzing the graphs representing the dependence of mechanical properties and the hardness in the stage of deformation, the following conclusions were drawn: 1) The strain hardening of the steel during cold rolling is not proportional to the stage of deformation. It is most effective in the beginning of deformation and becomes less pronounced as the deformation increases. 2) During cold forming the anisotropy of the steel properties increases, mainly for the EI811 type steel. 3) The relative elongation during cold rolling decreases disproportionately to the strain hardening of the steel. For all steels investigated it was found that after a deformation of 60% there is hardly any change in relative elongation. 4) The hardness of relatively plastic steels increases 1.2-2 times during cold rolling, whereas in less plastic steels, displaying a considerable hardness already before the rolling process, hardness increased only slightly. There are 2 sets of figures.

ASSOCIATION: Zavod"Zaporozhstal'" (Zaporozhstal' Plant)

KSENZUK, Feofan Andreyevich; TROSHCHENKOV, Nikolay Alekseyevich; GOROBINCHENKO, V.M., red. izd-va; DOBUZHINSKAYA, L.V., tekhn. red.

[Rolling and finishing of stainless steel strips] Prokatka i otdelka polosovoi nerzhaveiushchei stali. Moskva, Metallurgizdat, 1963. 205 p. (MIRA 16:7)
(Rolling (Metalwork)) (Steel, Stainless)

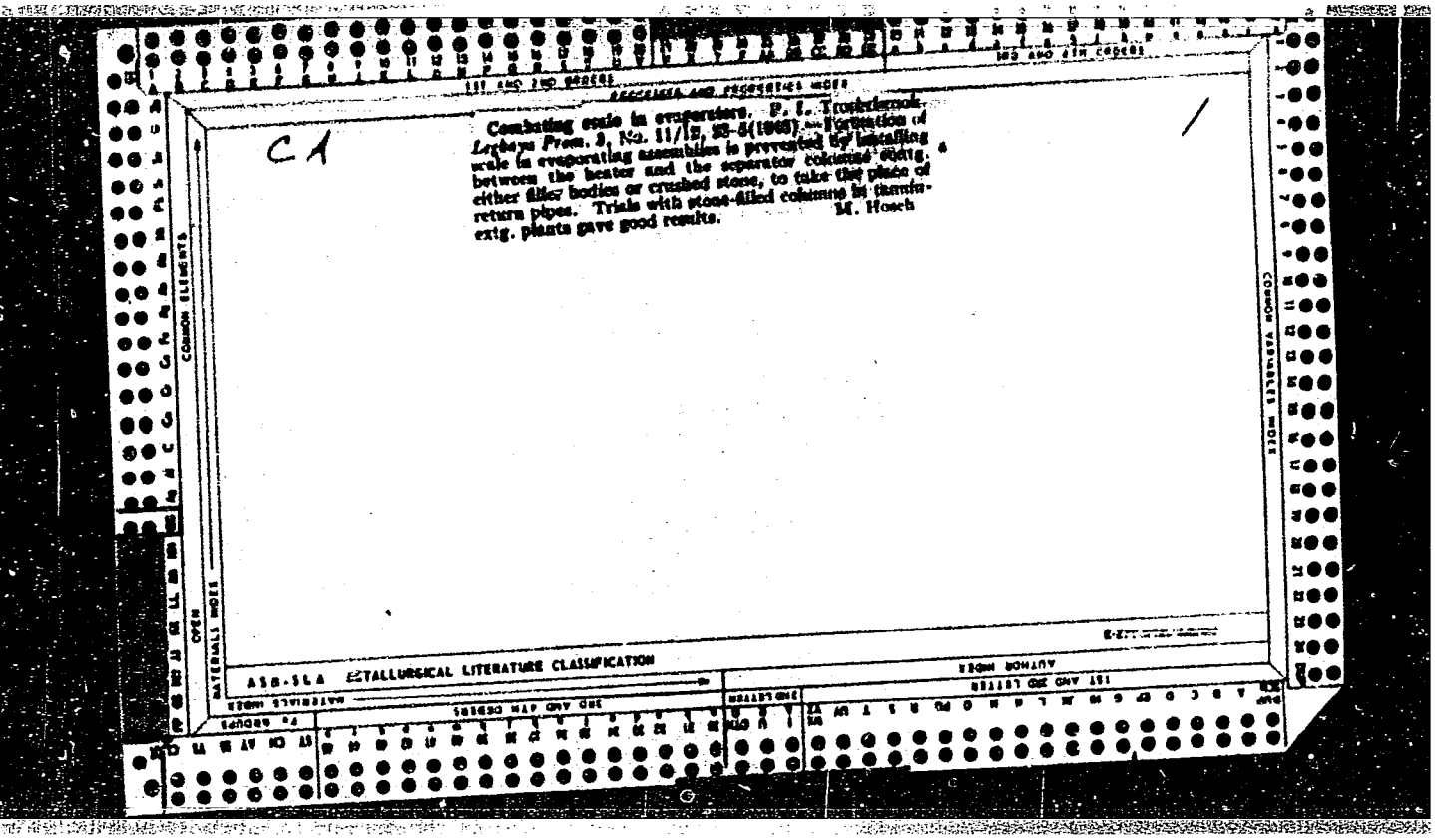
MANCHINSKIY, V.G.; TROSHENKOV, B.V.

Losses of gas pressure in a moving layer of materials. Trudy LPI no.225:149-155 '64. (MIRA 17:9)

TROSHCHENKOV, N.A.; TILIK, V.T.; MOVSHOVICH, V.S.

Quality of the cut of strip edges. Metallurg 8 no.5:29 My '63. (MIRA 16:7)

1. Zaporozhskiy staleplavil'nyy zavod.
(Metal cutting—Quality control)



TROSHCHENKOVSKIY, A.F., inzh.

Selecting optimum loading for vibratory mills. Stroi. i dor. mash. 9 no.11:25-27 N '64 (MIRA 18:2)

KARAYEV, M.A.; OSIPOV, R.G.; TROSHCHINSKAYA, S.S.

Results of splenoportography in the diagnosis of portal hypertension. Azerb. med. zhur. 42 no.6:11-16 Je '65. (MIRA 18:9)

1. Iz kafedry fakul'tetskoy khirurgii (zaveduyushchiy - prof. A.N. Tairov) pediatricheskogo i sanitarno-gigiyenicheskogo fakul'teta Azerbaydzhanskogo gosudarstvennogo meditsinskogo instituta im. N.Narimanova i 4-y klinicheskoy gorodskoy bol'nitsy g. Baku im. Fuada Efendiyeva (glavnyy vrach - A.Ya.Ismaylov).

TROSHEV, Totiu

Radioactive aerosols. Fiz mat spisanie BAN 6 no. 4:276-283 '63.

KARASEV, K.I., kand. khim.nauk; MAKOTINSKIY, M.P., kand. arkh.; TROSHICHEV, V.M.; Prinimali uchastiye: LUTSIK, L.D., inzh.; FEDOROVA, G.M., tekhnik; LIVSHITS, A.M., inzh.; ANDREYEV, V.S., retsenzent; MIRENSKIY, B.R., inzh., retsenzent; GURVICH, E.A., red.izd-va; TEMKINA, Ye.L., tekhn. red.

[Catalog of finishing materials and products] Katalog otdelochnykh materialov i izdelii. Moskva, Gosstroiizdat. Pt.2. [Paints and lacquers] Kraski i laki. 1961. 76 p. (MIRA 16:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov. 2. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR (for Andreyev).
(Paint materials—Catalogs)

TROSHCHILOVA, G.G.

TROSHCHILOVA, G.G.

Osteopathy caused by syringomyelia. Vest.rent. i rad. 32 no.3: 98-100 My-Je '57. (MIRA 10:10)

1. Iz kafedry rentgenologii i radiologii (zav. - dotsent V.N. Shtern) Saratovskogo gosudarstvennogo meditsinskogo instituta (dir. - dotsent V.A.Nikitin).

(SYRINGOMYELIA, compl.
bon e brittleness)
(BONE DISEASES, etiol. and pathogen.
brittleness caused by syringomyelia)

PALISHKIN, D.A.; IVANOV, V.I.; MAKARENKO, L.N.; GALAOV, K.K.; TROSHCHIN, S.I.; KRTSYUK, V.I.; STEPANOV, A.D.; SAZONOVA, N.I.; KUZNETSOVA, M.P.; PISARENKO, G.N.; LOBKOV, M., red.

[Mechanization in animal husbandry] Mekhanizatsiia v zhivotnovodstve. Stavropol', Stavropol'skoe knizhnoe izd-vo, 1963. 287 p. (MIRA 17:8)

KIL'MAN, Ya.I., kand.tekhn.nauk; Prinimali uchastiye: BATOVA, G.S.; TROSHCHINA, L.G.

Stabilization of the thermal decomposition of highly concentrated ammonium nitrate melts. Khim.prom. no.1:66-69 Ja '62. (MIRA 15:1)

1. Gosudarstvennyy institut azotnoy promyshlennosti.
(Ammonium nitrate)

TROSHCHINSKIY, I.A., inzh.

Stand for determining the angle of static stability in tractors. Mekh. i elek. sots. sel'khoz. 19 no.6:49-50 '61. (MIRA 14:12)

1. Gosudarstvennoye spetsial'noye konstruktorskoye byuro po sel'skokhozyaystvennoy tekhnike Sovnarkhoza Gruzinskoy SSR.
(Stability of tractors)

TROSHCHINSKIY, I.A.

Studying the dynamics of the 0.6t-class mountain tractor. Trakt. i sel'khozmash. 33 no.3:15-18 Mr '63. (MIRA 16:11)

1. Gosudarstvennoye spetsial'noye konstruktorskoye byuro po sel'skokhozyaystvennoy tekhnike.

TROSHCHINSKIY, I.A.

New design of steering mechanisms. Trakt.i sel'khozmash. 31 no.9:10-12 S '61. (MIRA 14:10)

1. Gosudarstvennoye spetsial'noye konstruktorskoye byuro po chayu.

(Steering gear)

TROSHCHINSKIY, I.A., inzh.

Self-propelled DSSh-14 chassis. Mekh. i elek.sots.sel'khoz. no.5: 44-47 '56. (MIRA 12:4)

1. Gruzinskaya mashinoispytatel'naya stantsiya.
(Tractors)

TSYGANOV, M.S., prof., doktor sel'skokhozyaystvennykh nauk; TROSHCHIY, A.I.

Cutting slit furrows across slopes helps to increase grass yields.
Zemledelie 8 no.10:61-65 O '60. (MIRA 13:10)

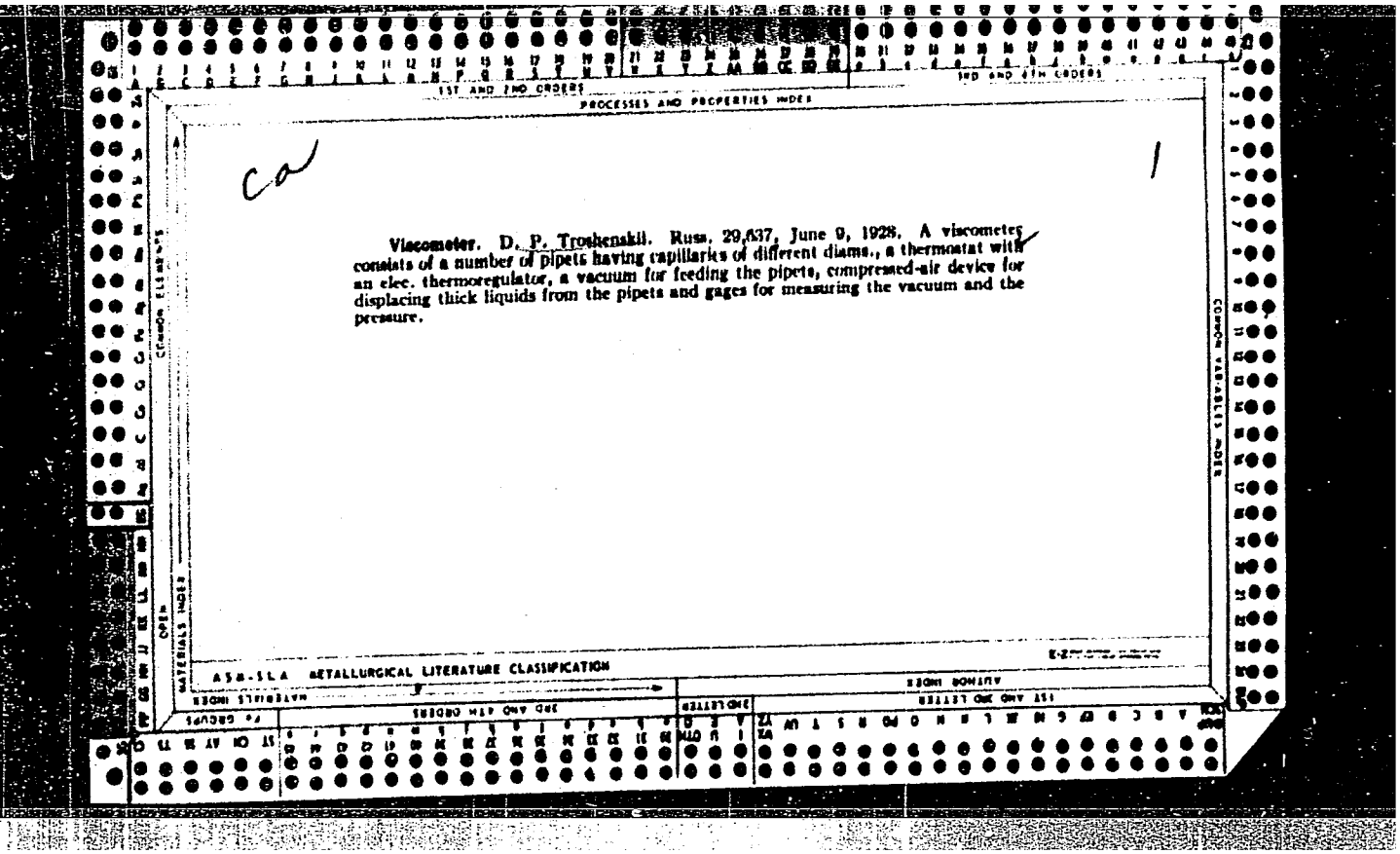
1. Voronezhskiy sel'skokhozyaystvennyy institut.
(Pastures and meadows) (Tillage)

ZAKHAROVA, T.A., dotsent; TROSHENKO, L.S., vrach

Occupational pathology in the production and use of polyvinyl chloride plastics. Trudy KGMI no.10:27-30 '63.

(MIRA 18:1)

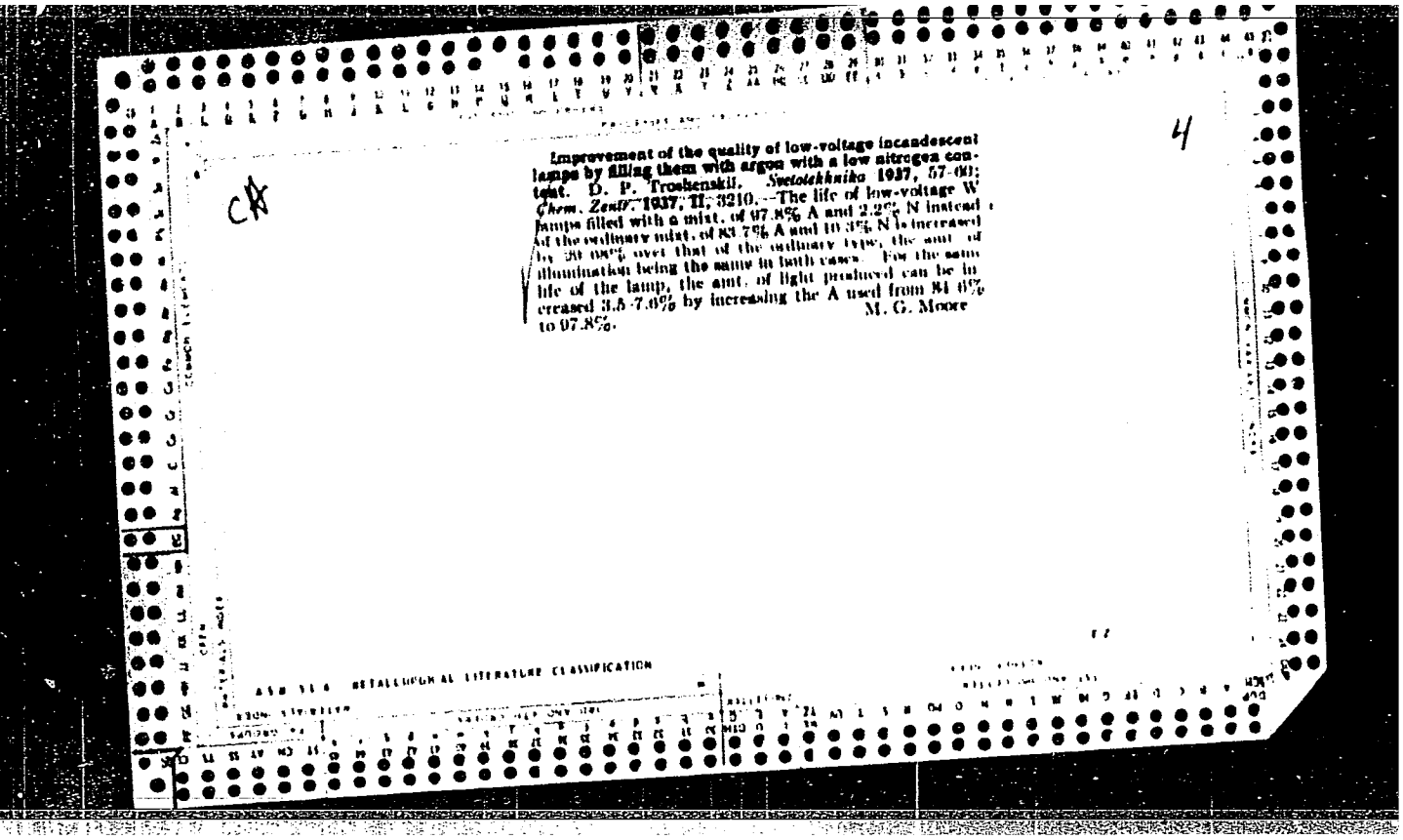
1. Iz kafedry propedevtiki vnutrennikh bolezney (zav. kafedroy dotsent A.N.Kushnev), Kalininskogo gosudarstvennogo meditsinskogo instituta.



TROSHENOK, P.I.

Hardboards made of spent tanbark. Kozh.obuv.prom. 3 no.4:35 Ap '61.
(MIRA 14:5)

1. Glavnyy inzhener Vol'skogo ekstraktovogo zavoda.
(Tanning materials)
(Hardboard)



Improvement of the quality of low-voltage incandescent lamps by filling them with argon with a low nitrogen content. D. P. Troshenskii. *Svetotekhnika* **1937**, 57-61; *Chem. Zentr.* **1937**, II, 3210.—The life of low-voltage W lamps filled with a mixt. of 97.8% A and 2.2% N instead of the ordinary mixt. of 83.7% A and 16.3% N is increased by 50 (80?)% over that of the ordinary type, the amt. of illumination being the same in both cases. For the same life of the lamp, the amt. of light produced can be increased 3.5-7.0% by increasing the A used from 84.0% to 97.8%.

M. G. Moore

TROSHENSKIY, D.P., inzh.

Effect of the pressure of argon on the quality of incandescent lamps. Svetotekhnika 8 no.7:6-10 Jl '62. (MIRA 15:6)

1. Moskovskiy elektrolampovyy zavod.
(Electric lamps, Incandescent)

20857

9.4120 (1003,1105,1140)

S/048/61/025/003/047/047
B104/B203

AUTHORS: Nilender, R. A. and Troshenskiy, D. P.

TITLE: Adaptation of luminophores as light sources

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 3, 1961, 435-439

TEXT: This paper was read at the 9th Conference on Luminescence (Crystal Phosphors) in Kiyev, June 20-25, 1960. The development of tube luminophores was started in the Soviet Union 20 years ago. Under the direction of S. I. Vavilov, work was carried out at the laboratories of the Moskovskiy elektrolampovyy zavod (Moscow Plant of Electric Tubes) together with the Fizicheskiy institut Akademii nauk (Institute of Physics of the Academy of Sciences) and the laboratories of the VEI. The first luminophore for tubes was cadmium silicate activated with manganese and magnesium tungstate. The Gosudarstvennyy opticheskiy institut (State Optical Institute) was also engaged in further investigations. The industrial production of a calcium halogen phosphate activated with antimony and manganese was started at the "Krasnyy khimik" ("Red Chemist") Plant.

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Adaptation of luminophores as...

Further improvement of this luminophore in 1955-60 is described, and its properties are pointed out. Thus, it is stated that antimony as a sensitizer acts in the trivalent state only. The best halogen phosphate luminophores are, in their structure, similar to apatite in which the calcium is replaced by antimony or manganese. Besides, the replacement of fluorine in this compound by chlorine produces a slight shift of the wavelengths emitted. Antimony forms luminescent centers in the apatite lattice. To prevent the occurrence of hydrosilicate, it is necessary to observe certain conditions in the apatite precipitation and optimum temperatures in the heat treatment. The optimum content of antimony lies at 0.7 - 0.8 %. If manganese is introduced and the fluorine/chlorine ratio is changed, the spectral composition of emission changes, but the stability of the luminophore is not affected. Further, it was found that 4.9 metal atoms should come to 3 phosphorus atoms to obtain maximum brightness and stability. On the basis of the above results, an improved halogen phosphate has been developed; it is being produced now and yields 10 % more light (with 40-w tubes, the light yield is 48-55 lumen per watt). Aging of tubes is connected with the destruction of antimony centers. Thus, reducing compounds cause, in the gas medium, a decrease in lumines-

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cence of the luminophore by reduction of antimony which can be annulled by oxidation of the reduced antimony. This circumstance is considered in the production of tubes. Due to the production process, the brightness of the luminophore drops by 20-24 % in the finished tube as compared with its maximum brightness. Production methods have been developed with further treatment by weak hydrochloric acid solution after the heat treatment at 1100°C (15-30 min). Such treatment removes manganese oxides from the surface and produces a light yield of 95-97 % of the maximum possible yield. By a reduction of temperature and the use of protective layers it was possible to reduce the liberation of impurities introduced. By an improved vacuum treatment of the tubes and subsequent training of the cathodes with high-voltage discharges in Hg vapor, it was possible to reduce the drop in luminous intensity from 20-30 % to 10-14 % within 3000 hr. The 40-w tubes thus produced had a light yield of 60-62 lumen per watt. V. M. Skobelev, Ch. B. Lushchik, D. P. Troshchenskiy, and T. A. Krasnova took part in the subsequent, extensive discussion taking reference to papers by V. L. Levshin, B. D. Ryzhikov, and V. I. Dolgopolov of the VNISI. There are 6 references: 1 Soviet-bloc and 4 non-Soviet-bloc.